SPRING OATS For Illinois

Variety Trials 1945-1949
Disease Hazards 1949

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TO HELP GROWERS CHOOSE the best adapted varieties of oats, the results of the 1945-1949 field-plot trials and the 1949 reactions to disease are reported in the following tables. Varieties were tested at four locations and are grouped by number of years grown. Clinton is included in each group in order to provide a variety with which all others may be compared.

Recommended Varieties

On the basis of their performance for at least three years, the following varieties are recommended for Illinois:

Northern Illinois	Central Illinois	Southern Illinois
Clinton[a]	Clinton[a]	Benton
Andrew	Andrew	Clinton[a]
Bonda	Bonda	Marion
Marion	Benton	Columbia
	Marion	
	Mindo	

([a] Includes all selections from Clinton: 11, 59, and Reselect.)

Canadian varieties are not recommended for Illinois. Two Canadian varieties, Ajax and Beaver, although they have shown high-yielding ability in recent trials, are not recommended. They are extremely susceptible to crown or leaf rust and to smut. In a 1944 field trial heavily infected with crown rust, Ajax yielded only 8 bushels an acre while Clinton yielded 66 bushels. Moreover, these Canadian varieties have a low test weight and a high percentage of hulls. Other Canadian varieties tested in the past have shown these same undesirable characteristics.

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Table 1. — NORTHERN ILLINOIS (Mt. Morris 1945-1948; DeKalb 1949): Results of Tests With Spring Oat Varieties

Rank	Variety	C.I. No.[a]	Yield above (+), or below (−) average of all varieties[b]	Average yield per acre	Yield in 1949	Test weight per bushel	Plants erect at harvest	Height of plants	Groats	Disease reaction,[c] 1949			
										Leaf rust, Race 45	Stem rust	Smut	Septoria
Grown 5 years, 1945-1949			*bu.*	*bu.*	*bu.*	*lb.*	*perct.*	*in.*	*perct.*				
1	Ajax	4157	+ 9.0	79.3	38.9	31.8	89.6	40.8	68.1	M	R-M	S	M
2	**Clinton**	3971	+ 8.9	**79.2**	**37.4**	**35.1**	**93.4**	**38.5**	**73.3**	S	R	R-M	S
3	Marion	3247	+ 5.0	75.3	38.0	33.4	87.5	40.1	72.6	M	R	R	S
4	Columbia	2820	+ 2.3	72.6	32.6	33.3	67.6	39.2	73.4	S	S	S	..
5	Sixty-Day	....	− 9.5	60.8	34.9	29.7	51.1	37.3	72.6	S	S	S	..
	Difference necessary for significance	....	.....	**8.3**	**4.3**	....	....	....	....	..	..	..	..
Grown 4 years, 1946-1949													
1	**Clinton**	3971	+ 9.0	**79.6**	**37.4**	**34.6**	**91.7**	**38.6**	**72.9**	S	R	R-M	S
2	Bonda	4329	+ 2.0	72.6	36.2	36.1	88.3	40.8	71.0	S	R	R	S
3	Benton	3910	+ .6	71.2	37.5	34.5	86.7	41.4	73.7	S	R	R-M	M
4	Eaton	3908	− .8	69.8	37.9	31.7	84.0	38.6	69.8	S	R	R	M
5	Mindo	4328	− 6.0	64.6	25.4	33.5	72.3	35.5	69.6	S	R-M	R	S
	Difference necessary for significance	....	.....	**9.3**	**4.3**	....	....	....	....	..	..	..	..
Grown 3 years, 1947-1949													
1	Clinton Selection 59	4259	+ 9.9	77.1	33.7	34.5	89.0	37.1	71.2	S	R	R-M	S
2	Marion × Clinton 43-262	5628	+ 8.8	76.0	32.9	32.5	76.3	36.9	73.8	M	R	M	..
3	**Clinton**	3971	+ 5.6	**72.8**	**37.4**	**34.4**	**89.3**	**38.2**	**73.5**	S	R	R-M	S
4	Clinton Selection 11	4606	+ 3.6	70.8	27.4	34.1	89.1	36.6	74.0	S	R	R-M	S
5	Andrew	4170	+ 3.5	70.7	37.9	34.0	78.2	37.7	74.0	S	R-M	R	S
6	Shelby	4372	+ .1	67.3	37.7	34.5	76.6	41.6	70.3	S	R-M	R	R
	Difference necessary for significance	....	.....	**11.2**	**4.3**	....	....	....	....	..	..	..	..

[a,b,c] See footnotes at bottom of next page.

Table 1. — Concluded

Rank	Variety	C.I. No.[a]	Yield above (+), or below (−) average of all varieties[b]	Average yield per acre	Yield in 1949	Test weight per bushel	Plants erect at harvest	Height of plants	Groats	Disease reaction,[c] 1949			
										Leaf rust, Race 45	Stem rust	Smut	Septoria
Grown 2 years, 1948-1949			*bu.*	*bu.*	*bu.*	*lb.*	*perct.*	*in.*	*perct.*				
1	Zephyr	4800	+11.1	63.5	36.2	31.2	81.3	37.3	65.5	S	R-M	R	S
2	**Clinton**	3971	+ 4.2	**56.6**	**37.4**	**33.1**	**86.9**	**35.3**	**73.0**	S	R	R-M	S
3	Nemaha	4301	+ 2.7	55.1	31.7	32.5	76.9	32.8	70.0	M	R-M	R-M	S
4	Advance	3845	+ 2.1	54.5	37.4	33.7	79.4	39.3	70.5	S	R-M	R	R
5	Beaver	4521	− 1.5	50.9	30.8	30.6	85.7	39.0	70.5	S	..	S	R
6	Cherokee	3846	− 4.9	47.5	29.4	33.0	64.4	32.4	70.0	S	R-M	R-M	S
	Difference necessary for significance	....	.....	**13.9**	**4.3**	....	....	....	....	..	..	..	..
Grown in 1949 only													
1	**Clinton**	3971	+ 3.0	**37.4**	**37.4**	**32.2**	**86.3**	**28.5**	**73.0**	S	R	R-M	S
2	Clinton × Columbia 44-266-32	....	+ 1.5	35.9	35.9	33.0	78.8	29.8	71.0	R-M	..	S	..
3	Colo	3972	+ .4	34.8	34.8	31.7	78.3	33.7	68.0	M	R-M	R	S
4	Missouri 0-200	4626	+ .2	34.6	34.6	32.8	75.0	31.0	67.5	S	R-M	R	S
4	Clinton × Columbia 44-264-72	....	+ .2	34.6	34.6	32.3	75.0	26.5	65.7	S	R	M	..
6	Clinton × Columbia 44-266-26	....	− 1.6	32.8	32.8	33.2	75.0	31.0	70.0	R-M	..	M	..
7	Benton × Marion 43-H25	....	− 5.2	29.2	29.2	32.0	85.0	29.5	70.0	S	R	S	..
8	Clinton × Columbia 44-266-28	....	− 8.0	26.4	26.4	31.4	70.0	30.0	71.0	R-M	..	M	..
9	Clinton × Marion 46-540	....	− 8.9	25.5	25.5	31.3	82.5	31.3	68.5	S	..	R	..
10	Clinton × Marion 46-501	....	−13.2	21.2	21.2	32.0	77.5	30.0	67.5	M	..	M	..
	Difference necessary for significance	....	.....	**4.3**	**4.3**	....	....	....	....	..	..	..	..

[a] Accession number of the Division of Cereal Crops and Diseases, U. S. Department of Agriculture.
[b] Each variety has been compared with all varieties grown the same years.
[c] R = resistant, M = moderately resistant (tolerant or intermediate), R-M = susceptible to one or more races, S = susceptible.

Table 2. — CENTRAL ILLINOIS (Urbana): Results of Tests With Spring Oat Varieties

Rank	Variety	C.I. No.[a]	Yield above (+), or below (−) average of all varieties[b]	Average yield per acre	Yield in 1949	Date headed	Test weight per bushel	Plants erect at harvest	Height of plants	Groats	Disease reaction,[c] 1949			
											Leaf rust, Race 45	Stem rust	Smut	Septoria
Grown 5 years, 1945-1949			*bu.*	*bu.*	*bu.*	*June*	*lb.*	*perct.*	*in.*	*perct.*				
1	Ajax	4157	+ 8.9	77.3	47.9	18	31.9	78.8	42.7	69.4	M	R-M	S	M
2	**Clinton**	3971	+ 3.2	**71.6**	**44.0**	**17**	**34.0**	**93.9**	**38.5**	**73.9**	S	R	R-M	S
3	Marion	3247	+ 2.7	71.1	42.8	14	33.7	71.8	42.7	76.3	M	R	R	S
4	Benton	3910	− 1.2	67.1	41.9	16	34.7	78.5	43.4	76.3	S	R	R-M	M
5	Columbia	2820	− 3.6	64.8	38.1	11	34.2	67.3	41.2	73.6	S	S	S	..
6	Sixty-Day	....	− 5.6	62.8	39.2	11	31.0	62.9	39.6	75.0	S	S	S	..
	Difference necessary for significance	....	.....	2.9	4.2	..	....	....	....	....	..	..	..	..
Grown 4 years, 1946-1949														
1	Mindo	4328	+ 7.0	72.9	46.1	12	34.0	72.8	36.3	71.7	S	R-M	R	S
2	Eaton	3908	+ 3.4	69.3	46.5	17	31.4	86.7	38.5	70.2	S	R	R	M
3	**Clinton**	3971	+ 2.0	**67.9**	**44.0**	**17**	**33.3**	**92.6**	**37.3**	**73.4**	S	R	R-M	S
4	Bonda	4329	+ 1.1	67.0	49.2	14	35.2	76.5	42.3	70.9	S	R	R	S
	Difference necessary for significance	....	.....	3.4	4.2	..	....	....	....	....	..	..	..	..
Grown 3 years, 1947-1949														
1	Andrew	4170	+11.2	75.2	55.9	11	32.1	61.5	39.1	74.0	S	R-M	R	S
2	Marion × Clinton 43-262	5628	+ 7.5	71.5	50.8	14	32.2	73.7	38.8	74.0	M	R	M	..
3	Columbia × Clinton 43-283	5630	+ 7.3	71.3	50.5	16	33.4	79.9	39.9	71.2	M	R	S	..
4	Clinton Selection 59	4259	+ 6.6	70.6	45.5	17	33.7	89.5	37.5	73.7	S	R	R-M	S
5	Clinton Selection 11	4606	+ 3.3	67.3	43.7	16	34.0	86.9	38.0	75.0	S	R	R-M	S
6	**Clinton**	3971	+ 2.6	**66.6**	**44.0**	**17**	**32.3**	**90.2**	**38.3**	**73.5**	S	R	R-M	S
7	Shelby	4372	0	64.0	44.0	19	31.4	75.5	42.7	70.4	S	R-M	R	R
	Difference necessary for significance	....	.....	4.4	4.2	..	....	....	....	....	..	..	..	..

[a,b,c] See footnotes at bottom of next page.

Table 2. — Concluded

Rank	Variety	C.I. No.[a]	Yield above (+), or below (−) average of all varieties[b]	Average yield per acre	Yield in 1949	Date headed	Test weight per bushel	Plants erect at harvest	Height of plants	Groats	Disease reaction,[c] 1949			
											Leaf rust, Race 45	Stem rust	Smut	Septoria
Grown 2 years, 1948-1949			*bu.*	*bu.*	*bu.*	*June*	*lb.*	*perct.*	*in.*	*perct.*				
1	Zephyr	4800	+ 6.3	61.6	46.2	17	29.6	64.3	40.3	69.8	S	R-M	R	S
2	Beaver	4521	+ 5.6	60.9	44.8	13	29.2	71.5	41.4	71.3	S	..	S	R
3	**Clinton**	3971	− 1.7	**53.6**	**44.0**	**15**	**31.3**	**86.8**	**36.0**	**73.3**	S	R	R-M	S
4	Advance	3845	− 2.1	53.2	39.2	13	31.4	60.3	44.3	73.8	S	R-M	R	R
5	Nemaha	4301	− 5.0	50.3	39.5	11	32.8	62.5	34.9	73.0	M	R-M	R-M	S
6	Cherokee	3846	− 7.2	48.1	42.5	11	32.6	54.6	35.5	71.0	S	R-M	R-M	S
	Difference necessary for significance	....	.....	**5.8**	**4.2**	..	....	....	....	....	..	..	..	..
Grown in 1949 only														
1	Clinton × Columbia 44-264-72	....	+ 8.7	53.0	53.0	3	29.5	72.5	34.5	65.0	S	R	M	..
2	Michigan (Bond × Anthony)	5298	+ 5.1	49.4	49.4	5	32.3	85.0	39.0	67.5	S	R-M	R	S
3	Clinton Reselect	4969	+ 1.5	45.8	45.8	9	29.6	90.0	37.0	66.5	S	R	R-M	S
4	Benton × Marion 43-H25	....	+ 1.4	45.7	45.7	8	29.0	90.0	41.0	69.0	S	R	S	..
5	**Clinton**	3971	− .3	**44.0**	**44.0**	**9**	**29.5**	**91.0**	**36.0**	**72.0**	S	R	R-M	S
6	Wisc. (Forward × Victoria-Richland) × Forward	5013	− 1.6	42.7	42.7	14	25.3	85.0	39.5	63.0	M	R-M	R	M
7	Clinton × Marion 46-501	....	− 2.4	41.9	41.9	5	31.0	77.5	37.0	67.0	M	..	M	..
8	Clinton × Columbia 44-266-28	....	− 3.1	41.2	41.2	4	33.3	72.5	38.0	71.0	R-M	..	M	..
9	Clinton × Marion 46-540	....	− 4.2	40.1	40.1	6	32.3	70.0	42.0	67.0	S	..	R	..
10	Clinton × Columbia 44-266-32	....	− 5.8	38.5	38.5	7	32.3	72.5	38.0	71.0	R-M	..	S	..
11	Colo	3972	− 6.1	38.2	38.2	8	29.0	90.0	41.0	67.0	M	R-M	R	S
12	Missouri 0-200	4626	− 6.2	38.1	38.1	5	32.5	72.5	39.7	68.0	S	R-M	R	S
	Difference necessary for significance	....	.....	**4.2**	**4.2**	..	....	....	....	....	..	..	..	..

[a] Accession number of the Division of Cereal Crops and Diseases, U. S. Department of Agriculture.
[b] Each variety has been compared with all varieties grown the same years.
[c] R = resistant, M = moderately resistant (tolerant or intermediate), R-M = susceptible to one or more races, S = susceptible.

Table 3. — SOUTHWESTERN ILLINOIS (Alhambra): Results of Tests With Spring Oat Varieties

Rank	Variety	C.I. No.[a]	Yield above (+), or below (−) average of all varieties[b]	Average yield per acre	Yield in 1949	Test weight per bushel	Plants erect at harvest	Height of plants	Groats	Disease reaction,[c] 1949			
										Leaf rust, Race 45	Stem rust	Smut	Septoria
Grown 4 years, 1945, '46, '48, '49			*bu.*	*bu.*	*bu.*	*lb.*	*perct.*	*in.*	*perct.*				
1	Benton	3910	+ 4.6	34.7	43.5	32.2	73.5	36.2	70.5	S	R	R-M	M
2	**Clinton**	3971	+ 1.3	**31.4**	**36.0**	**29.5**	**76.2**	**31.1**	**67.5**	S	R	R-M	S
3	Columbia	2820	0	30.1	34.8	29.3	50.7	33.3	67.3	S	S	S	..
4	Marion	3247	− .3	29.8	28.7	28.9	68.8	33.5	69.3	M	R	R	S
5	Sixty-Day	....	− 2.6	27.5	31.3	25.3	52.4	31.8	68.5	S	S	S	..
	Difference necessary for significance	....	.....	**2.4**	**3.6**	....	....	....	....	..	..	..	..
Grown 2 years, 1948-1949													
1	Columbia × Clinton 43-283	5630	+ 5.5	45.5	42.5	28.8	51.7	33.8	65.8	M	R	S	..
2	Marion × Clinton 43-262	5628	+ 3.4	43.4	36.7	28.5	46.5	30.4	69.3	M	R	M	..
3	Nemaha	4301	+ 2.1	42.1	40.8	29.5	46.5	31.4	69.3	M	R-M	R-M	S
3	Andrew	4170	+ 2.1	42.1	42.6	29.2	50.3	32.9	70.3	S	R-M	R	S
5	Mindo	4328	+ 1.8	41.8	36.4	28.7	44.8	31.0	63.8	S	R-M	R	S
6	**Clinton**	3971	− .9	**39.1**	**36.0**	**28.2**	**52.3**	**30.9**	**68.3**	S	R	R-M	S
7	Clinton Selection 11	4606	− 1.1	38.9	35.4	27.6	42.9	30.1	66.7	S	R	R-M	S
8	Cherokee	3846	− 1.7	38.3	37.3	28.9	43.9	31.3	67.3	S	R-M	R-M	S
	Difference necessary for significance	....	.....	**3.4**	**3.6**	....	....	....	....	..	..	..	..
Grown in 1949 only													
1	Missouri 0-200	4626	+ 1.7	37.8	37.8	26.8	78.4	35.6	66.0	S	R-M	R	S
2	**Clinton**	3971	− .1	**36.0**	**36.0**	**24.1**	**92.0**	**32.3**	**65.5**	S	R	R-M	S
2	Bonda	4329	− .1	36.0	36.0	26.3	88.4	37.8	58.5	S	R	R	S
4	Colo	3972	− 6.0	30.1	30.1	22.9	74.2	35.2	66.7	M	R-M	R	S
5	Zephyr	4800	− 8.8	27.3	27.3	20.0	80.0	35.3	57.0	S	R-M	R	S
	Difference necessary for significance	....	.....	**3.6**	**3.6**	....	....	....	....	..	..	..	..

[a] Accession number of the Division of Cereal Crops and Diseases, U. S. Department of Agriculture.

[b] Each variety has been compared with all varieties grown the same years.

R = resistant, M = moderately resistant (tolerant or intermediate), R-M = susceptible to one or more races, S = susceptible.

Table 4. — EXTREME SOUTHERN ILLINOIS (Dixon Springs Experiment Station): Results of Tests With Spring Oat Varieties

Rank	Variety	C.I. No.[a]	Yield above (+), or below (−) average of all varieties[b]	Average yield per acre	Yield in 1949	Test weight per bushel	Plants erect at harvest	Height of plants	Groats	Disease reaction,[c] 1949			
										Leaf rust, Race 45	Stem rust	Smut	Septoria
Grown 3 years, 1947-1949			*bu.*	*bu.*	*bu.*	*lb.*	*perct.*	*in.*	*perct.*				
1	**Clinton**	3971	**+11.0**	**29.2**	**20.7**	**27.6**	**79.1**	**26.8**	....	S	R	R-M	S
2	Marion	3247	+ 7.0	28.8	23.5	28.5	53.3	29.4	....	M	R	R	S
3	Benton	3910	+ 1.3	26.7	22.4	30.2	81.7	29.9	....	S	R	R-M	M
4	Mindo	4328	+ .4	25.8	15.8	27.5	65.0	24.7	....	S	R-M	R	S
5	Columbia	2820	− 2.4	23.7	17.4	28.0	26.7	27.3	....	S	S	S	..
	Difference necessary for significance	....	.....	....	**3.1**	....	....	....	....	..	..	..	..
Grown 2 years, 1948-1949													
1	**Clinton**	3971	+ .6	**21.3**	**20.7**	**24.8**	**73.0**	**26.7**	....	S	R	R-M	S
2	Andrew	4170	+ .3	20.8	19.5	29.8	59.0	29.6	....	S	R-M	R	S
3	Clinton Selection 11	4606	+ .1	20.6	19.8	28.7	80.0	27.0	....	S	R	R-M	S
	Difference necessary for significance	....	.....	**2.2**	**3.1**	....	....	....	....	..	..	..	..
Grown in 1949 only													
1	Marion × Clinton 43-262	5628	+ 1.5	21.8	21.8	25.5	78.3	29.3	....	M	R	M	..
2	Bonda	4329	+ 1.2	21.5	21.5	26.8	75.0	31.0	....	S	R	R	S
3	Clinton Selection 59	4259	+ .9	21.2	21.2	25.8	73.3	28.3	....	S	R	R-M	S
3	Cherokee	3846	+ .9	21.2	21.2	28.0	68.3	28.9	....	S	R-M	R-M	S
5	**Clinton**	3971	+ .4	**20.7**	**20.7**	**24.8**	**73.3**	**27.6**	....	S	R	R-M	S
6	Nemaha	4301	+ .3	20.6	20.6	28.5	66.6	28.7	....	M	R-M	R-M	S
7	Shelby	4372	− 1.4	18.9	18.9	24.9	75.0	32.2	....	S	R-M	R	R
	Difference necessary for significance	....	.....	**3.1**	**3.1**	....	....	....	....	..	..	..	..

[a] Accession number of the Division of Cereal Crops and Diseases, U. S. Department of Agriculture.
[b] Each variety has been compared with all varieties grown the same years.
[c] R = resistant, M = moderately resistant (tolerant or intermediate), R-M = susceptible to one or more races, S = susceptible.

Diseases Prevalent in 1949[1]

Leaf rust. For the first time since the introduction of Bond-type oats, Race 45, a strain of leaf or crown rust, was observed early enough in the growing season to cause damage to oats. It did not, however, develop to its greatest extent, partly at least because of another oat disease. In certain local areas Race 45 did cause heavy losses. Estimated loss for the entire state was 2 percent.

Stem rust. Stem rust, observed only in local areas, caused very little damage. Estimated loss for the state was a mere trace.

Smut. The two species of smut were estimated to have cut oat yields more in the southern than in either the central or northern part of the state. The heavier loss in southern Illinois can undoubtedly be attributed in part to the larger acreage of susceptible varieties grown there. The estimated loss for the state as a whole was about 0.5 percent. The loss in 1949 was about the same as in 1948. The fact that the loss has remained about the same for the past two years indicates that the amount of smut infection is not building up to any great extent.

Septoria leaf spot and stem rot. In the past Septoria has been considered one of the minor diseases of oats. In 1949, however, it was serious in local areas throughout the central and northern parts of the state. It usually causes a leaf spot only. But under favorable conditions, such as long periods of high humidity and normal temperatures, a stem rot develops under the top leaf sheath. When this happens, the top leaf is killed and the stem itself rots. Infected plants ripen prematurely, and the stems break. Some of the newer oat varieties, such as Colo and Andrew, appear to be very susceptible to this disease.

"Grey spot" or "red leaf." First observed in 1948, this disease was general throughout the state in 1949. The cause is not yet known. The disease may be observed first as a reddening of the leaf when the plants are 1 to 2 feet high. As the plant grows, all leaves, beginning with the lower ones, die. By the time the crop matures, the plants in the infected parts of the field are ashy gray. Both yield and test weight in these areas are low. The size of the infected areas varies from 4 to 20 feet across. Sometimes infected areas overlap and create a much larger one. Grey spot has no apparent effect on seed germination.

Until a technic has been developed for producing this disease artificially, varietal resistance or susceptibility cannot be studied. Field observations indicate, however, that all varieties in commercial production in Illinois are susceptible.

[1] Data on disease prevalence and estimate of losses are based on surveys made by G. H. Boewe, Assistant Plant Pathologist, Illinois State Natural History Survey.

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